REMARKS

Status of the Claims:

With the above amendments, claims 6 and 18 have been amended. Claims 1-20 are pending and ready for further action on the merits. No new matter has been added by way of the above amendments. Claims 6 and 18 have been amended for clarity. These amendments are non-narrowing amendments. Reconsideration is respectfully requested in light of the following remarks.

Rejections under 35 U.S.C. § 112, Second Paragraph

Claims 6 and 18 have been rejected under 35 U.S.C. § 112, second paragraph as being indefinite. The Examiner asserts M^{I} and M^{III} are compounds but the list that follows are metals. Claims 6 and 18 have been amended so that the M^{I} and M^{III} no longer recite that they are compounds. Withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 1-2, 9, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Beutel '743 (US Patent No. 5,145,743).

Claims 1-3, 5-7, 9-10, 12-13 and 20 are rejected under 35 USC §103(a) as being unpatentable over Weiss '550 (US Patent No. 4,028,550) in view of Leblans '578 (US Patent No. 5,360,578).

Claim 4 is rejected under 35 USC §103(a) as being unpatentable over Weiss '550 in view of Leblans '578 and further in view of Jamil '916 (US Patent No. 5,772,916).

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Weiss '550 in view of Leblans '578 and further in view of Ochiai '971 (US Patent No. 4,501,971).

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Weiss '550 in view of Leblans '578 and further in view of Hultsch '454 (US Patent No. 4,405,454).

These rejections are traversed for the following reasons.

Present Invention

The present invention as recited in claim 1 relates to a method for manufacturing a radiation image conversion panel, comprising the steps of:

a) dispersing a calcined product of stimulable phosphor in a dispersion medium, to obtain a slurry;

b) eliminating grains that are of at least a predetermined size from the slurry of step a), using wet classification;

c) adding to the slurry of step b), a binder that is substantially soluble therein, to prepare a coating material; and

d) applying the coating material to a support and drying to thereby form a phosphor layer.

Disclosure of Beutel '743

Beutel '743 discloses an X-ray intensifying screen comprising phosphor crystals said to have an effective amount of a light scattering particulate material, e.g., barium sulfate, strontium sulfate, calcium sulfate, titanium dioxide or magnesium oxide, adhered thereto. This screen is said to give high speed and yield an image with increased sharpness when exposed with a single-side coated medical X-ray film element, compared to one made without the particulate material.

Disclosure of Weiss '550

Weiss '550 discloses X-ray screens said to have reduced mottle that exhibit improved image quality and are prepared using europium-activated fluorohalide phosphors having an aminocoumarin brightening agent added thereto.

Disclosure of Leblans '578

Leblans '578 discloses a method for preparing metal halide phosphor particles (e.g. barium- and/or strontium-containing halide phosphor particles) of a selected particle size range. The method comprises the following steps: (1) firing the raw mixture materials of said phosphor to produce a sintered phosphor mass that is pulverized, (2) mixing said pulverized phosphor mass, optionally after one or more firings, in a liquid mainly containing a water-miscible organic solvent with an organic acid dissolved therein, said acid being capable of forming with metal contained in the phosphor a salt the solubility of which in water at 20°C is less than 0.5 g per 100 ml, and (3) subjecting the treated phosphor particles in wet and/or in dry state to a separation treatment to collect phosphor particles having a grain size smaller than 40 μm but larger than 2 μm.

Disclosure of Jamil '916

Jamil '916 discloses a phosphor powder for producing a high resolution phosphor screen and a phosphor screen. The phosphor screen comprises a substrate, an infrared-absorbing layer, and a phosphor layer coated on the infrared-absorbing layer. The

phosphor layer comprises a phosphor powder in which a substantial amount of particles in the powder have a particle size as measured in the longest dimension of greater than 0 and less than about 5 microns. The phosphor screen may also comprise a black, infrared-absorbing substrate with the phosphor layer coated on the substrate. The phosphor powder is formed by preparing a phosphor composition, sintering the composition to form ingots, grinding the ingots to form a powder wherein a substantial amount of particles in the powder have a particle size of greater than 0 and less than about 5 microns. The powder is then reactivated in an inert atmosphere to a temperature of from about 500°C to about 550°C, wherein the suspension of the powder is prepared in a non-reactive organic solvent, and the suspension is mixed to separate particles of the powder which partially fuse during reactivation and to break up large agglomerates of the powder in the suspension. Finally, the suspension is decanted to at least partially separate the non-reactive inorganic solvent and the powder, and the powder is dried to form the phosphor powder.

Disclosure of Ochiai '971

Ochiai '971 discloses a radiographic intensifying screen comprising a substrate and a fluorescent layer provided thereon and consisting essentially of a binder and a radio-luminescent phosphor dispersed therein. The binder comprises a linear polyester resin or a linear polyester resin crosslinked with a crosslinking agent.

Disclosure of Hultsch '454

Hultsch '454 discloses a process for the de-watering and particle classification of solids from suspensions, (e.g. coal from a slurry in which the coal is transported). Hultsch '454 further discloses the use of a de-watering centrifuge having two frustoconical centrifuge drum sections of different inclinations such that in a first filtering zone the particles are preliminarily dewatered and then pass by automigration to the next centrifuge drum at which further dewatering takes place. The suspension on the first sieve surface forms a thin layer classification zone having a thickness up to 5 mm and in which the coarse fraction is retained while the fine fraction is passed. The coarse fraction automigrates to the next sieve surface where it is de-watered and the fine fraction separated

out in the thin layer classifying zone is then filtered under pressure in a subsequent stage.

Removal of the Rejections over Beutel '743, Weiss '550 in view of Leblans '578, Weiss '550 in view of Leblans '578 and further in view of Jamil '916, Weiss '550 in view of Leblans '578 and further in view of Ochiai '971, and Weiss '550 in view of Leblans '578 and further in view of Hultsch '454

The Examiner asserts that changing the order of the method steps is *prima facie* obvious absent a showing of new or unexpected results.

Applicants submit that the instant invention does show results that are unexpectedly superior to the method disclosed in the disclosures of Weiss '550 and Beutel '743. Because either Weiss '550 or Beutel '743 occur in all of the above rejections, Applicants submit that these unexpected results are sufficient to overcome all of the rejections.

In particular, the unexpectedly superior results of the instant invention are a direct result of the order of the method steps. In claim 1, a wet classification step is performed after mixing a stimulable phosphor and a dispersion medium, before adding a binder. Because the mixture does not contain the binder, the mixture has lower viscosity. Thus, a finer meshed screen can be used in the wet classification step to obtain finer particles of stimulable phosphor. At page 29, line 9, it

is explained that a nylon mesh of 20 mm size, which corresponds to 508 mesh, is used.

In contrast to the instantly claimed invention, Beutel '743 uses a coarse mesh of 75 mesh (column 5, line 2) because the mixture contains the binder before wet classification. Thus, the mixture has a higher viscosity. Accordingly, Beutel '743 cannot attain a radiation image conversion panel of fine particles of stimulable phosphor. In other words, Beutel '743 cannot attain the instant invention.

Similar to Beutel '743 and in contrast to the instant invention, Weiss '550 also cannot attain the instant invention. Weiss '550 uses a coarse mesh of 200 mesh (column 4, line 11) because the mixture contains binder before wet classification. Thus, the mixture has a higher viscosity. Accordingly, Weiss '550 also cannot attain a radiation image conversion panel of fine particles of stimulable phosphor. In other words, Weiss '550 cannot attain the instant invention. For the above reasons, Applicants submit that all rejections have been obviated.

Withdrawal of the rejections is warranted and respectfully requested.

Allowable Subject Matter

Applicants would like to thank the Examiner for acknowledging that claims 14-17 and 19 are allowable.

Conclusion

With the above remarks and amendments, it is believed that the claims, as they now stand, define patentable subject matter such that a passage of the instant invention to allowance is warranted. A Notice to that effect is earnestly solicited.

If any questions remain regarding the above matters, please contact Applicant's representative, T. Benjamin Schroeder (Reg. No. 50,990), in the Washington metropolitan area at the phone number listed below.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of one (1) month to April 24, 2003 in which to file a reply to the Office Action. The required fee of $110.00 is enclosed herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any

additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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MSW/TBS/bsh
attachment: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been amended as follows.

6. (Amended) A method for manufacturing a radiation image conversion panel according to claim 1, wherein the step of dispersing includes providing a calcined product of a stimulable phophor that is a rare earth-activated alkaline earth metal fluoro-halide based phosphor, represented by a constitutional formula (I) as follows:

$$(Ba_{1-a}, M^{II}_{a})FX \cdot bM^{I} \cdot cM^{III} \cdot dA:xLn \qquad (I)$$

wherein, M^{II} indicates at least one kind of alkaline earth metal selected from the group consisting of Sr, Ca, and Mg; M^{I} indicates at least one kind of alkali metal [compound] selected from the group consisting of Li, Na, K, Rb, and Cs; M^{III} indicates at least one kind of trivalent metal [compound, excluding Al_2O_3,] selected from the group consisting of Al, Ga, In, Tl, Sc, Y, Cd, and Lu, wherein compounds that contain M^{III} exclude Al_2O_3; X indicates at least one kind of halogen selected from the group consisting of Cl, Br, and I; Ln indicates at least one kind of rare earth element selected from the group consisting of Ce, Pr, Sm, Eu, Gd, Tb, Dy, Ho, Nd, Er, Tm, and Yb; A indicates at least one kind of metallic oxide selected

from the group consisting of Al_2O_3, SiO_2, and ZrO_2; and a, b, c, d and x are respectively set so as to satisfy relational expressions $0 \leq a \leq 0.3$, $0 \leq b \leq 2$, $0 \leq c \leq 2$, $0 \leq d \leq 0.5$, and $0 < x \leq 0.2$.

18. (Amended) A method for manufacturing a radiation image conversion panel according to claim 14, wherein the step of dispersing includes providing a calcined product of a stimulable phophor that is a rare earth-activated alkaline earth metal fluoro-halide based phosphor, represented by a constitutional formula (I) as follows:

$$(Ba_{1-a}, M^{II}_a)FX \cdot bM^{I} \cdot cM^{III} \cdot dA : xLn \qquad (I)$$

wherein, M^{II} indicates at least one kind of alkaline earth metal selected from the group consisting of Sr, Ca, and Mg; M^{I} indicates at least one kind of alkali metal [compound] selected from the group consisting of Li, Na, K, Rb, and Cs; M^{III} indicates at least one kind of trivalent metal [compound, excluding Al_2O_3,] selected from the group consisting of Al, Ga, In, Tl, Sc, Y, Cd, and Lu, wherein compounds that contain M^{III} exclude Al_2O_3; X indicates at least one kind of halogen selected from the group consisting of Cl, Br, and I; Ln indicates at least one kind of rare earth element selected from the group consisting of Ce, Pr, Sm, Eu, Gd, Tb, Dy, Ho, Nd, Er, Tm, and

Yb; A indicates at least one kind of metallic oxide selected from the group consisting of Al_2O_3, SiO_2, and ZrO_2; and a, b, c, d and x are respectively set so as to satisfy relational expressions $0 \leq a \leq 0.3$, $0 \leq b \leq 2$, $0 \leq c \leq 2$, $0 \leq d \leq 0.5$, and $0 < x \leq 0.2$.